

PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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JAPYGIDAE OF SOUTH AMERICA. 3: JAPYGIDAE  
OF CHILE

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The Japygidae of Chile are all members of the two subfamilies Parajapyginae and Japyginae. The subfamily Parajapyginae remained unknown in Chile until the present paper. Two specimens of *Parajapyx isabellae* (Gr.) were collected in irrigated soils in avocado orchards at La Cruz, Valparaiso Province, Chile, 16 April and 17 March 1961, by L. M. Smith and Nelson Hichins and five specimens on the Fundo Santa Teresa, Quillota, Valparaiso Province, by Dr. L. Caltagirone on 16 August 1961. No other specimens of this subfamily are known from Chile.

The great bulk of Chilean japygids therefore belong to the subfamily Japyginae. The great subfamily Evalljapyginae, dominant along the Pacific Coast of North America, through Mexico and as far south as Guatemala, has not yet been found in Chile. The Japyginae of Chile, as set forth in this paper, are:

- Teljapyx megalocerus* (Silv.). San Vicente (Concepción)
- Teljapyx profundus* L. Smith. El Cobre, Valparaiso Prov.
- Teljapyx riestrae* Silv. Temuco
- Nelsjapyx hichinsi* L. Smith. Viña del Mar
- Nelsjapyx soldadi* L. Smith. El Cobre, Valparaiso Prov.
- Rossjapyx australis* L. Smith. Puyehue, Osorno Prov.; Mocopulli, Chiloe Prov.; Los Muermos, Llanquihue Prov.
- Rossjapyx anodus* (Silv.). Temuco and Villa Rica
- Chiljapyx caltagironei* L. Smith. Olmué-Limache
- Valpjapyx botani* L. Smith. Viña del Mar
- Valpjapyx talcae* L. Smith. Talca
- Penjapyx altus* L. Smith. La Laguna, Cordillera de Coquimbo

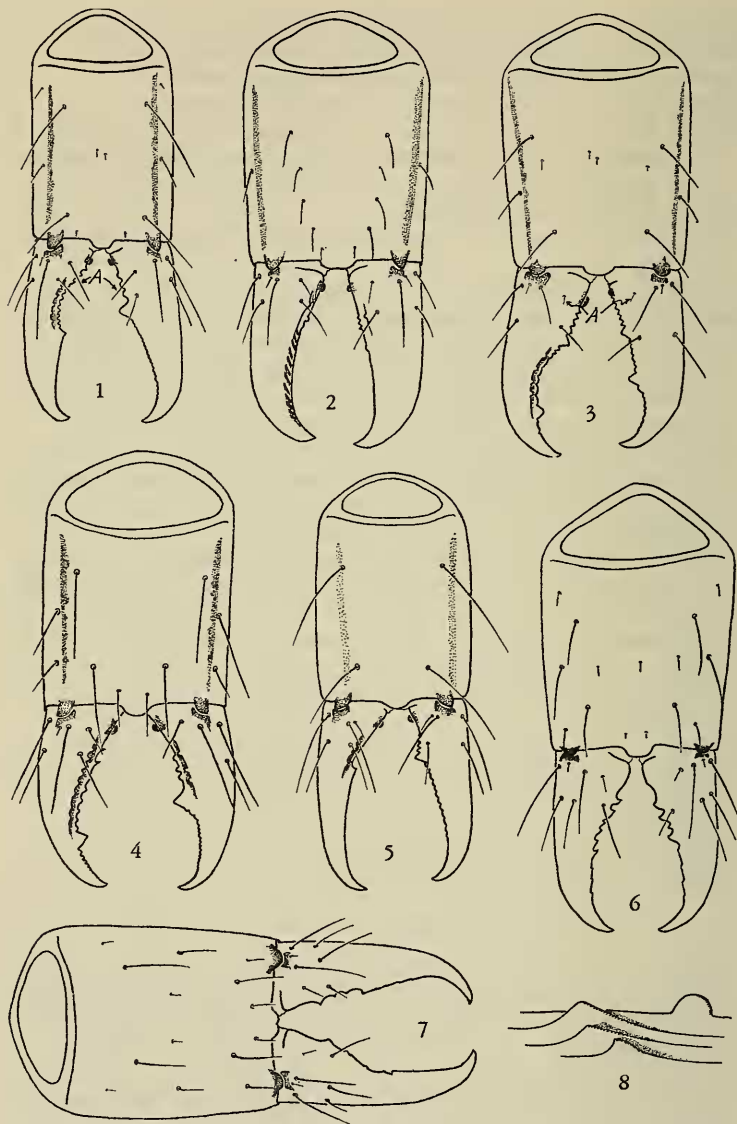
## ABBREVIATIONS AND TERMS USED

- M = macrosetae, larger setae of the body set in reinforced setal sockets, so as to move anteriorly and posteriorly, but not laterally.
- m = sub-macrosetae, medium-sized setae usually set in simple setal sockets.
- Microsetae = minute setae visible only under high magnification, always set in simple sockets.
- Antecedent setae = those setae on sternite I just anterior to the lateral and median subcoxal areas, set in reinforced setal sockets, more or less reversed from those of M.
- Trichobothria = specialized seta-like sensoria located on antennal segments 4, 5, and 6, consisting of a large setal socket, not reinforced, from which projects a long rod-like seta of uniform diameter, which under extreme magnification is seen to be plumose.
- Proliferated setae of the antennae = accessory setae on 4 to 6 segments near the middle of an antenna. These proliferated setae lie between the basal and distal whorls of setae and are postero-lateral on the segment when the antenna is extended to the side.
- Friction setae = a type of microseta with large sockets which occurs in groups where the body integument folds or moves upon itself and would otherwise cause abrasion.
- Calcar setae = two setae at the ventral apex of a tibia which may be thicker or more robust than other tibial setae, but not longer than these latter setae.
- Glandular setae = one or more rows of strongly tapered setae, without setal sockets located on the intersegmental membrane just posterior to sternite I, between the styli but not usually meeting in the mid-line.
- Sensory setae = one row of thin setae with large simple sockets located just posterior to the glandular setae when the area is evaginated. When the intersegmental area is invaginated the sensory setae appear to lie anterior to the glandular setae.
- Setae A of the forceps = a dorso-median seta of the primitive whorl of large setae at the base of each arm of the forceps (Fig. 1).
- Placoid sensillae = disc or oval-shaped sensory areas on the ultimate segment of the antenna, usually in two whorls.
- Sensillae of the female = two groups of microsetae with large sockets located at either side of the genital opening of the female on slightly raised areas, which are comparable to the papillae of the male.
- Lateral subcoxal organs = the area occupied by the glandular setae and the sensory setae on the intersegmental membrane posterior to sternite I and between the styli.
- Median subcoxal area = an area between the lateral subcoxal organs, usually projected to the rear when the area is evaginated. When this area contains special structures it is often called the median subcoxal *organ*.

- Prepleurite = the small anterior sclerite of an abdominal pleuron.  
Pleurite = the large posterior sclerite of an abdominal pleuron.  
Apotome = the anterior sclerite of an abdominal sternum.  
Sternite = the posterior sclerite of an abdominal sternum.  
Genital area = the entire area on the intersegmental membrane between segments VIII and IX, devoted to reproduction. This area can only be studied when evaginated and the following definitions relate to the structure when evaginated.  
Papillae = two palp-like structures at either side of the genital orifice in the male.  
Anterior lobes = two lobes anterior to the genital orifice.  
Posterior flap = a large median projection posterior to the genital orifice.  
Spermatophore burster = a sclerotized tube or needle-like structure, internal in the female, slightly anterior to the genital orifice. This structure has been called spermatheca by some workers, but spermatophore burster may be its true function.  
Carinae = a pair of sclerotized lines on the tergum of segment X or on the sternum of this segment, called dorsal carinae or ventral carinae.  
Acropygidium = a semicircular or flatter projection of tergite X in the mid-dorsal region, dorsal to the forceps.  
Dorsal articulation of the forceps = a heavily sclerotized ball of a ball-and-socket type of moving joint for the forceps which lies internal in segment X but is distinctly visible in cleared specimens.  
Basal buttress = a sclerotized ventral projection of the forceps near their bases, which does not function as a tooth.  
Tooth = a larger projection of the ventral edge of either arm of the forceps.  
Toothlet = a smaller projection on the forceps which is pointed.  
Denticle = a smaller projection on the forceps which is rounded, hemispherical.  
Predental = basal to the first large tooth.  
Postdental = distal to the last large tooth.  
Interdental = between two large teeth.

#### **Valpjapyx**, new genus

Distal lamina of lacinia pectinate, lacinia falciform, without a tooth, antenna with 35 to 44 segments, four or more antennal segments showing ventral setal proliferation on midsection of antenna, mandible with five teeth with dorsal tooth small, labrum not emarginate or slightly so, lateral subcoxal organs each occupying one-third of the distance between the styli, glandular setae of two lengths: posterior row with setae twice as long as those in anterior row, longest glandular setae two-thirds as long as stylus, sensory setae half as long as shorter glandular setae, sensory setae separated by width of setal socket, median subcoxal area projecting posteriorly with 3 + 3 setae on posterior edge, no disculi or pores, tarsal claws unequal, empodium shorter than pretarsus and directed upward, styli with small rounded secondary cone, external seta



FIGS. 1-7. Dorsal views of tergite X and forceps, showing dorsal setae and the first two whorls of setae on the forceps, other setae omitted. 1, *Telphusa profundus* L. Smith, ♀. 2, *Rossjapyx australis* L. Smith, ♂. 3, *Chiljapyx caltagironei* L. Smith, ♀. 4, *Valpjapyx botani* L. Smith, ♀. 5, *Penjapyx altus* L. Smith, ♂. 6, *Nelsjapyx hichinsi* L. Smith, ♀. 7, *Nelsjapyx soldadi*, ♀. FIG. 8, denticles at base of left arm of forceps of *Rossjapyx australis* L. Smith.

one-fourth to one-half as long as stylus, one basal pore, abdominal tergite I prescutum 1 + 1M, scutum 1 + 1M, tergites I to VI with postero-lateral angles rounded, tergite VII with angles projected to the rear, tergite X between the carinae 2 + 2M and 1 + 1 large posterior m, carinae distinct, convergent posteriorly, acropygidium prominent, rounded, forceps: seta A well developed (Fig. 4), dorsal articulation elongated, pointed to the rear, basal buttress large and conspicuous, both arms of forceps biseriate, right arm with a large slightly premedian tooth, pre-dental tubercles  $\frac{2}{3}$ , postdental tubercles 12-20, left arm with smaller, postmedian tooth, pre-dental tubercles  $\frac{3}{10}$ , postdental tubercles 10-12.

Type: *Valpjapyx botani* L. Smith.

***Valpjapyx botani*, new species**

*Female*: Head with about 18 + 18 long setae and 12 + 12 shorter setae, distal lamina of lacinia with about 12 teeth, lacinia falciform, without tooth or flange, all laminae curved, galea with one external seta, thumb of galea with two lateral setae and about 20 projections of which four large ones form an external line to the apex, terminal segment of maxillary palpus with 22 setae, the longest, median, 1.6 times as long as stylus I, antenna with 35 segments, tapered, segment 3 of antenna with 42 setae of various lengths not distinctly arranged in two whorls, segments 13 to 19 with postero-ventral proliferation of setae between the distal and basal whorl, terminal segment of antenna not hemispherical, placoid sensillae 2, trichobothria equal in length to longest seta on same segment, labial palpus somewhat tapered, three times as long as wide at the base, with 16 setae of which the longest, terminal, almost as long as the palpus.

*Thorax*: Setae typical except scutum of mesothorax apparently 6 + 6M by strong development of a pair of antero-lateral m, mesocoxa with 4 large and 7 small setae, trochanter with 5 large and 11 small setae, dorsal apex of femur with a close row of 6 setae as follows: 3 large, 1 small, 1 large, and 1 small with the small setae approximately half as long as the long setae, ventral apex of tibia with only one stout calcar seta, tarsi with 6 or 7 large setae in each ventral row, tarsal claws unequal, empodium subequal to pretarsus, parallel to claws.

*Abdomen*: Tergite I prescutum 1 + 1M, scutum 1 + 1M and a few microsetae, tergite II 3 + 3M and 5 + 5m, tergites III-VII 5 + 5M with discal setae disappearing on posterior segments and replaced by enlarged lateral setae, tergites I-VI with postero-lateral angles rounded, tergite VII with angles projected to rear, tergite VIII dorsal 6 + 6 setae, segment IX dorsal no setae, tergite X between carinae 2 + 2M and 1 + 1 large postero-median m, and microsetae, carinae distinct, convergent, pygidium prominent, rounded. Sternum I apotome 4 + 4M alternating with 5 + 5m, sternite 16 + 16M and 20 + 20m, antecedent setae 19 + 20 in two irregular rows, lateral subcoxal organs each occupying two-fifths of the distance between the styli, composed of two anterior rows of short glandular setae and one posterior row of long glandular setae each about

twice as long as the short glandular setae, long glandular setae widely separated  $19 + 19$ , equal in length to stylus I, short glandular setae with bases contiguous, about  $40 + 40$ , sensory setae shorter than the short glandular setae, about  $28 + 28$ , sparse, separated by 2 to 3 times the diameter of a setal socket, median subcoxal area protruding posteriorly with  $3 + 3$  setae on posterior margin, no disculi or pseudopores. Sterna II-VII apotomes without setae, sternites II-VII  $16 + 16M$ , sternum VIII  $8 + 8M$ ,  $6 + 6m$ , and microsetae, genital area: anterior lobes each with 5 long setae and 4 small sensory setae, posterior lobe with a row of 8 small sensory setae, papillary areas with  $10 + 12$  small sensory setae, spermatophore burster tubular, slightly curved and enlarged anteriorly, segment IX ventral  $3 + 3M$ , segment X between ventral carinae  $12 + 12M$  and  $9 + 9m$ , ventral carinae distinct.

*Forceps*: Seta A about one-third as long as adjacent long seta, dentition typical for the genus.

Male unknown.

Length of body including forceps: 15.0 mm.

*Types*: Holotype ♀ in California Academy of Sciences, paratype juvenile ♂ and one-third instar in University of California, Davis.

*Habitat*: The three above specimens were taken in soil and humus, Jardín Botánico Nacional, near Viña del Mar, Chile, 4 July 1961 by L. M. Smith and Nelson Hichins.

#### ***Valpajpyx talcae*, new species**

*Female*: Similar to *V. botani* L. Smith except: thumb of galea with 4 lateral setae, terminal segment of maxillary palpus with 32 setae, antenna with 44 segments, segment 3 of antenna with 50 setae of various sizes, placoid sensillae 6, trichobothria half as long as longest seta on same segment, tarsi with 9 or 10 large setae in each ventral row, tergites II-VII  $6 + 6M$ , tergite VIII  $5 + 5M$ , tergite IX  $3 + 3m$ , sternite I antecedent setae  $150 + 150$  reaching the mid-transverse line of the sternite, long glandular setae about  $40 + 40$ , short glandular setae and sensory setae correspondingly numerous, sterna II-VI with  $25 + 25M$  and numerous *m*, sternum VII with  $22 + 22M$ , sternum VIII with  $7 + 7M$ , forceps seta A three-fourths as long as adjacent long seta.

Male unknown.

Length of body including forceps: 23.0 mm.

*Types*: Holotype ♀ in California Academy of Sciences, two juveniles in University of California, Davis.

*Habitat*: All three specimens collected 22 miles north of Talca, Chile, 22 December 1950 by Ross and Michelbacher.

#### *Teljapyx* Silvestri, 1949

Silvestri's original description was very brief. The following paragraph defines the genus in more detail.

Distal lamina of lacinia pectinate, lacinia with slight subapical flange, antenna with 30 segments strongly tapered apically, four or more mid-

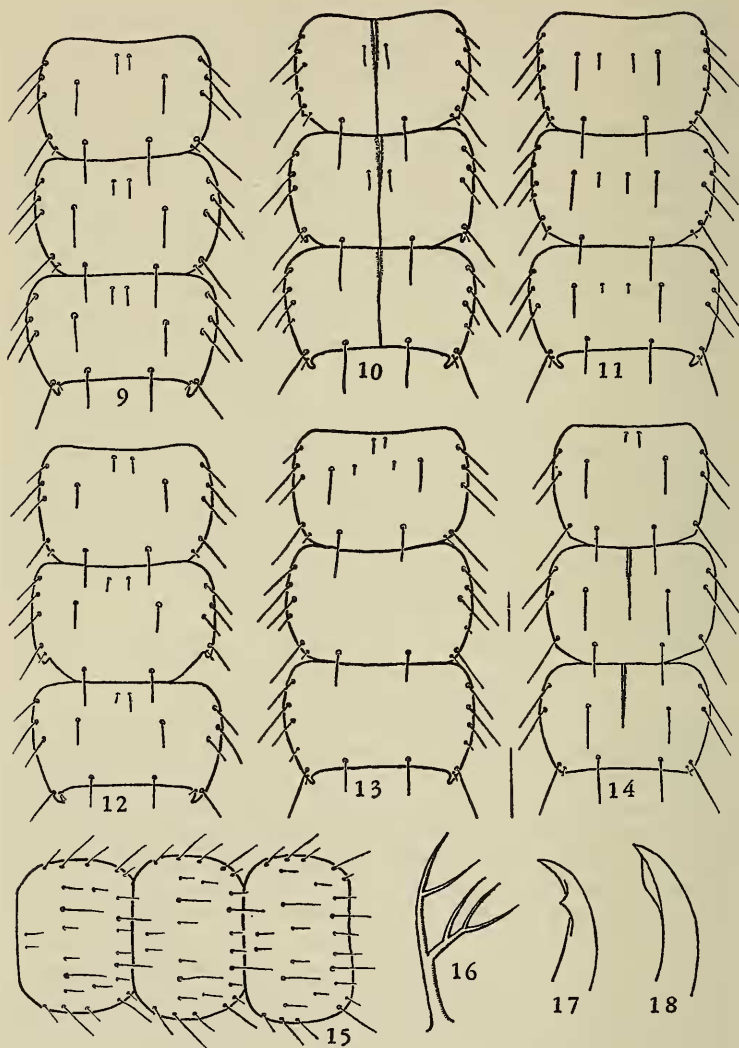
segments of the antenna showing setal proliferation, mandible with 5 teeth, labrum emarginate, lateral subcoxal organs each occupying about two-fifths of the distance between the styli, glandular setae of two lengths: one posterior row of long setae, each about half as long as stylus I, and two or three anterior rows of short glandular setae about half as long as the long glandular setae, one close row of sensory setae each about half as long as the short glandular setae, median subcoxal area only slightly projected to the rear with 1 + 1 microsetae and 2 + 2 pores, tarsal claws markedly unequal, empodium strongly developed, longer than the pretarsus and parallel to the claws, styli I-VII with large, pointed secondary cone, one seta half as long as the stylus, and two pores, abdominal tergum prescutum with 1 + 1M, scutum with 1 + 1M postero-medial or these may be reduced to m, tergite VII with postero-lateral angles projected to the rear, tergite VI angles rounded, or slightly projected to the rear, tergite X between the carina 2 + 2M and a pair of medio-lateral m which may be strongly developed in some species, carinae distinct, parallel, acropygidium prominent, rounded, forceps seta A well developed (Fig. 1), dorsal articulation elongate, pointed to the rear, basal buttress present, right arm of forceps uniseriate, large pre-medial pointed tooth, predental tubercles 3 slightly separated, post-dental margin crenulate, left arm basal half arcuate with  $\frac{9}{10}$  denticles of which the basal two or three are pointed and the others rounded and slightly separated from one another, median tooth small and continuous with the postdental margin which is entire.

Type: *Teljapyx riestrae* Silv. 1949 (original designation).

#### ***Teljapyx profundus*, new species**

*Female*: Head with about 16 + 16M and an equal number of large m, distal lamina of lacinia with 16 teeth, all laminae curved, galea with one external seta, thumb of galea slightly sclerotized with 3 terminal projections longer than the others, terminal segment of maxillary palpus with 23 setae, the largest, median, 1.2 times the length of the palpal segment, mandible with 5 teeth, antenna with 30 segments, tapered, segment 3 of antenna with a distal whorl of 25 setae and a basal whorl of 12 setae, longest seta 1.2 times greatest diameter of segment 3, trichobothria half as long as longest adjacent seta, setal proliferation on antennal segments 8-12, ultimate segment (sclerotized portion) 1.5 times as long as wide, placoid sensillae large, conspicuous in two whorls of 3 each, labial palpus tapered near the tip, three times as long as wide at the base, with 14 setae of various lengths, the longest, terminal equal in length to the palpus.

*Thorax*: Normal 10, 10, 10 and a few large m, with 1 + 1M on prescuta, longest seta 0.3 as long as corresponding tibia, mesocoxa with 3 large setae and 11 small setae, trochanter with 4 large setae and 9 small setae, dorsal apex of femur with a row of 4 setae, anterior one largest, tibia with one calcar seta distinguishable, tarsi with 5-6 large setae per ventral row, tarsal claws and empodium typical for genus.



FIGS. 9-15. Dorsal views of tergites V, VI and VII. 9, *Chiljapyx caltagironei* L. Smith, ♂. 10, *Teljapyx profundus* L. Smith, ♀. 11, *Valpjapyx talcae* L. Smith, ♀. 12, *Rossjapyx australis* L. Smith, ♂. 13, *Valpjapyx botani* L. Smith, ♀. 14, *Penjapyx altus* L. Smith, ♂. 15, *Nelsjapyx hichinsi* L. Smith, ♀. FIG. 16, branched seta from male sac, urite III, *Rossjapyx australis* L. Smith. FIG. 17, lacinia of *Chiljapyx caltagironei* L. Smith, showing a tooth. FIG. 18, lacinia of *Rossjapyx australis* L. Smith, showing a flange.



**Abdomen:** Tergite I prescutum 1 + 1M, scutum 8 + 8 microsetae, tergum II 3 + 3M, terga III-VI 6 + 6M with antero-median pair reduced posteriorly, tergum VII 5 + 5M by complete loss of antero-median pair, tergum VIII 4 + 4M, tergum IX 3 + 3 microsetae, tergum X between carinae 2 + 2M and 4 + 4 small m, all prescuta without setae, tergites VI and VII with postero-lateral angles projected to the rear, sides convex. Sternum I apotome 3 + 3M alternating with 4 + 4m, sternum 16 + 16M, antecedent setae small 28 + 30, lateral subcoxal organs each occupying two-fifths of the distance between the styli composed of one posterior row of long glandular setae and 3 rows anterior shorter glandular setae, sensory setae shorter than the short glandular setae, sockets nearly contiguous, about 50 + 50, median subcoxal area slightly projected to the rear, with 2 microsetae and 4 pores, sternum II-VII apotomes without setae, sternites II-VII with 17 + 17M, sternite VIII 7 + 7M and many microsetae, genitalia typical, sensillae 9 + 9, segment IX ventral 3 + 3M, sternite X between the ventral carinae 10 + 10M large setae of uniform size, scattered m and microsetae.

**Forceps:** Seta A half as long as adjacent long seta, dentition typical for the genus.

Male unknown.

Length of body including forceps: 17 to 21 mm.

**Type:** Holotype ♀ in California Academy of Sciences, paratype ♀ in University of California, Davis.

**Habitat:** Two females (above) found in loam soil 12 to 24 inches deep, Quebrada El Soldado, El Cobre, Valparaiso Province, Chile, 15 July 1961 by L. M. Smith and Nelson Hichins.

*Teljapyx riestrae* Silvestri, 1949

I have not seen specimens of this species. Silvestri described it from Temuco, Chile.

*Teljapyx megalocerus* (Silv.) 1901

Silvestri (1949) reported this species from Talcahuano, Concepción Province, Chile. This species does not fit well into the genus, but must remain here pending further collections and study.

KEY FOR THE SEPARATION OF THE SPECIES OF *Teljapyx*

1. Left arm of forceps with a large basal tooth, antenna with 52 segments, pronotum 6 + 6M, glandular setae all same length, median subcoxal area with 3 + 3 small setae, no pores, antennal segments clothed with hundreds of small setae .....  
 ..... *T. megalocerus* (Silv.)
- Left arm of forceps without basal tooth, antenna with 30 segments, pronotum 5 + 5M, glandular setae of two distinct lengths, median subcoxal area with 1 + 1 small setae and 2 + 2 pores, antennal segments not with vestiture of small setae ..... 2
2. Abdominal scutum I 1 + 1M, tergite VI postero-lateral angles rounded, antecedent setae 100 + 100, length of body 14 mm,

- discal area of abdominal tergites V-VII with 2 + 2M -----  
*T. riestrae* Silv.
- Abdominal prescutum I with no large setae, tergite VI postero-lateral angles projected to the rear, antecedent setae 28 + 30, length of body 17-21 mm, discal area of abdominal tergites V-VII with 1 + 1M -----  
*T. profundus* L. Smith

#### Nelsjapyx, new genus

Distal lamina of lacinia pectinate, lacinia falciform without a tooth, antenna with 26 segments (in type species), no distal proliferation on midsegments of antenna, labrum emarginate, mandible with four teeth, lateral subcoxal organs each occupying one-fourth of the distance between the styli, glandular setae subequal in length, arranged in a single row, sensory setae half as long as glandular, spaced about the width of one setal socket apart, median subcoxal area projecting posteriorly without disculi or pores, but with 2 + 2 microsetae, tarsal claws subequal, empodium absent or minute, styli with small secondary cone, external seta, and no pores, abdominal tergite I prescutum 1 + 1M, and 1 + 1 + 1m, scutum 4 + 4M and 3 + 3 large m near the mid-line, all tergites with postero-lateral angles broadly rounded, tergite X dorsum 3 + 3M and 6 + 1 + 6m, dorsal carinae absent, forceps seta A small (Fig. 6), articulation rounded, basal buttress absent, forceps nearly symmetrical, with toothlets but no denticles, both arms uniseriate, right arm with three toothlets in basal half, left arm slightly arcuate with two basal toothlets followed by 8 smaller toothlets. Males without setose sacs in segments III or IV.

Type: *Nelsjapyx hichinsi* L. Smith.

#### Nelsjapyx hichinsi, new species

*Female*: Head with about 15 + 15M dorsally, labrum emarginate, distal lamina of lacinia with 5 to 6 teeth, all laminae curved except the distal one, galea with one external seta, thumb of galea with usual projections, terminal segment of maxillary palpus with 8 setae of various sizes with the longest basal on the segment, mandible with 4 large teeth and a small dorsal knob representing the fifth tooth, antenna with 26 segments, very slightly tapered terminally, segment 3 with a distal whorl of 5M ventral and 2m dorsal, and a basal whorl of 3M dorsal and 2m ventral, terminal segment of antenna nearly hemispherical, placoid sensillae not visible, trichobothria as long as longest antennal seta on same segment, labial palpus barely tapered, twice as long as wide at the base, with 5 setae, two terminal slightly longer than the palpus.

*Thorax*: Prothorax with 5 + 5M and 4 + 4 large m, mesothorax prescutum 1 + 1M and 1 + 1m, scutum 5 + 5M and 6 + 6 large m, metathorax prescutum 1 + 1M and 2 + 2m, scutum 5 + 5M and 5 + 5 large m, legs: coxa 5 setae, trochanter 6 setae, dorsal apex of femur with a row of four large subequal setae, tibia with calcar setae not different from other large setae on the tibia, tarsi with 3 large ventral setae per row, tarsus strongly tapered to the tip, pretarsus small, empodium absent.

*Abdomen:* Tergite I prescutum 1 + 1M and 1 + 1 + 1m, scutum 1 + 1M and 6 + 6 large m, tergites II-VII 5 + 5M and 6 + 6 large m, tergite VIII 4 + 4M and 6 + 6 large m, tergite IX 4 + 4 setae on posterior margin, tergite X 3 + 3M and 7 + 1 + 7m on dorsum, dorsal carinae absent, pygidium broad and flat, not prominent. Sternum I apotome 3 + 3M and 4 + 4m alternating, sternite 9 + 9M and 11 + 11m, antecedent setae 7 + 7 in a straight row, lateral subcoxal organs protruding, each occupying one-fourth of the distance between the styli, glandular setae 12 + 14, all same length, arranged in a single row, length of seta half length of stylus I, sensory setae 10 + 12, half as long as glandular setae, distance between sensory setae once or twice socket diameter, median subcoxal area with posterior extension, rugose or wrinkled, no pores or disculi, but with 2 + 2 microsetae. Sterna II-VII apotomes without setae, sternites 16 + 16M and 16 + 16m, sternite VIII 7 + 7M and 12 + 12m, genital area: anterior lobes each with 5 long setae, posterior flap with 13 long setae, genital orifice not ringed with setae, at either side a raised area with 4 or 5 small sensory setae, spermatophore burster tubular; ventral portion of IX with 2 + 2M, sternum X 8 + 8M and 14 + 14m, ventral carinae indistinct. Abdominal pleurae: prepleurite with 1M and 1m, pleurite 2M and 3m. Styli uniformly tapered to a point.

*Forceps:* Right arm from base to tip: 2 large toothlets, one very small toothlet, one large toothlet, and 5 small flat toothlets, left arm from base to tip two large toothlets and 7 small toothlets.

*Male:* Similar to female, male genital papillae conical, 1.5 times as long as wide at the base, mesad surface with many long setae, laterad 4 long setae, genital orifice ringed with many small setae, no sensory sensillae on genital papillae, genital flap with one posterior row of 4 long setae and anterior row of 8 shorter setae. No male sacs in III or IV.

Length of body including forceps: average, females 6.5, males 6.0 mm.

*Types:* Holotype ♀ and paratype ♂ in California Academy of Sciences, paratypes in USNM, California Insect Survey, and University of California, Davis.

*Habitat:* Type female, 31 paratype females and 25 paratype males all collected at Jardín Botánico Nacional, Viña del Mar, Chile, by L. M. Smith and Nelson Hichins on 16 May and 4 July 1961. This species lives readily in dry leaf mold, and was found there during the dry season. In alcohol, specimens become very adhesive and all debris clings to them. A protective covering, like mucus (in alcohol) appears on the body and cannot be removed in lacto-phenol. Probably a special body coating enables this species to live under dry conditions, inimical to all other japygids.

Species dedicated to the collector, Mr. Nelson Hichins.

#### **Nelsjapyx soldadi**, new species

Similar to *N. hichinsi* L. Smith except: third segment of antenna with a distal whorl of 6 large setae ventral and 2m dorsal, terminal segment

with 2 placoid sensillae visible, labial palpus with 8 setae, six of which are large, trochanter with 7 setae, tarsi with four large ventral setae per row, empodium present, shorter than pretarsus, and pointed upward, antecedent setae 18 + 17 in two irregular rows, lateral subcoxal organs each occupying one-third of the distance between the styli, glandular setae 18 + 18, sensory setae 24 + 24, setal sockets not separated from one another, sternum X 9 + 9M, forceps left arm from base to tip two toothlets and arcuate margin, right arm four toothlets.

Length of body: average, females 6.0, male 5.0 mm.

*Types:* Holotype ♀ and paratype ♂ in California Academy of Sciences, paratypes in USNM and University of California, Davis.

*Habitat:* Type female, 3 paratype females and one male, 3 to 16 inches deep in loam soil, Quebrada El Soldado, El Cobre, Valparaiso Province, Chile, 15 July 1961 by L. M. Smith and Nelson Hichins. This species also has the gummy integument (in alcohol) as in *N. hichinsi*.

#### **Chiljapyx, new genus**

Distal lamina of lacinia pectinate, lacinia usually with 1 or 2 teeth, antenna with 30 segments (in type species), setal proliferation on mid-segments of the antenna, lateral subcoxal organs each occupying about one-fourth of the distance between the styli, and showing one to four rows of glandular setae in the male, and only one row of glandular setae in the female, sense setae not minute, medium subcoxal area without protruding flap and from 3 to 6 minute setae with large sockets at each side, no disculi, empodium between tarsal claws slightly longer than pretarsus and directed upward, all styli with large secondary cone, one large external seta and one or two basal pores, tergite I prescutum with 1 + 1M, scutum 2 + 2M, tergite VII with postero-lateral angles projected to the rear, tergite VI not projected, tergite X between the carinae 2 + 2M, forceps seta A minute, see Fig. 3, basal buttress well developed especially on left arm of forceps, dorsal articulation of forceps rounded, right arm with one premedian and one postmedian tooth, predental margin with (4-6) sharp toothlets, interdental margin uniseriate with (5-7) sharp toothlets, postdental margin crenulate, left arm of forceps with one basal and one distal tooth (which can encompass the large teeth of the right arm when the forceps close), predental margin with (4-6) sharp toothlets, interdental margin biserially dentate, postdental margin crenulate. Male without setose sacs in III or IV.

Type species: *Chiljapyx caltagironei* L. Smith.

This genus is similar to the genera *Hecajapyx* and *Occasjapyx* (Smith, 1959), which are known only from California, U.S.A., in the following respects: dentition of the forceps, basal buttress present, postero-lateral angles of tergite VII projected to the rear, seta A of the forceps minute, no disculi on the median subcoxal area, and males without setose sacs in urites III or IV. It may be that these three genera form a natural or phylogenetic group. They can be recognized by the following key:

1. Dorsal articulation of forceps rounded, distal lamina of lacinia

- pectinate, antennal segments 30 ..... *Chiljapyx*  
 Dorsal articulation of forceps projected and pointed posteriorly,  
 distal lamina of lacinia falciform, antennal segments 24 ..... 2
2. Median subcoxal area with two groups of short setae with large  
 sockets, terminal segment of the antenna twice as long as wide,  
 four midsegments of the antenna with marked proliferation of  
 setae, abdominal tergite I with 2 + 2M, postero-lateral angles  
 of tergite V projected to the rear, tergite X between the carinae  
 2 + 2M ..... *Occasjapyx*  
 Median subcoxal area without setae with large sockets, terminal  
 segment of the antenna about as long as wide, no proliferation  
 of setae on the antenna, abdominal tergite I with 3 + 3M,  
 postero-lateral angles of tergite V rounded, not projected to the  
 rear, tergite X between the carinae 2 + 1 + 2M ..... *Hecajapyx*

***Chiljapyx caltagironei*, new species**

*Female:* Head with 15 + 15M dorsally, labrum emarginate, lacinia with large median tooth, distal lamina of lacinia pectinate and nearly as long as the next lamina, all laminae curved, galea with two external setae, thumb of galea with many small projections and terminally three strong curved projections, terminal segment of maxillary palpus with 14 setae, four of which are very long, mandible with four strong teeth and a lateral knob representing the fifth tooth, antenna with 30 segments, slightly tapering apically, segment 3 with a whorl of 8 large setae and a basal whorl of 8 small setae, trichobothria  $\frac{1}{2}$  to  $\frac{2}{3}$  as long as the longest adjacent antennal seta, terminal segment of antenna narrower than the penultimate, placoid sensillae four, terminal four segments of antenna with minute circular sense organs as follows: segment 27 one, 28 three, 29 five, and segment 30 three, labial palpus with eight setae the two terminal of which are as long as the palpus.

*Thorax:* Normal, scuta each with 10M, legs normal, coxa with 3 setae, trochanter 4 setae, femur with a dorsal apical row of 4 subequal setae, tibia with two large calcar setae, tarsus with two ventral rows of 5 setae each, tarsal claws unequal, empodium as long as the pretarsus and pointed somewhat upward.

*Abdomen:* Tergite I 3 + 3M, tergite II-VI 7 + 7M, with postero-lateral angles rounded, tergite VII 7 + 7M with postero-lateral angles projected to the rear, sides convex, tergite VIII dorsally 2 + 2M, postero-lateral angles slightly projected to the rear, tergite IX 3 + 3m on the posterior margin, tergite X between the carinae 2 + 2M and 1 + 2 + 1m. Sternum I apotome 3 + 3M, sternite 16 + 16M and 30 + 30 shorter antecedent setae arranged in two irregular rows just anterior to the lateral subcoxal organs, each lateral subcoxal organ occupying one-fourth of the distance between the styli, composed of one irregular row of glandular setae the same length as the antecedent setae and a row of contiguous sensory setae, one-third as long as the glandular setae, glandular setae 8 + 8 in older specimens to 6 + 6 in young adults and

5 + 5 in the third instar, sensory setae as numerous as the glandular setae. Median subcoxal area without posterior extension and with 5 + 5 minute setae with large sockets in older specimens. Sterna II to VII apotomes no setae, sternites 16 + 16M and many microsetae, sternite VIII 7 + 7M, genital area with paired anterior lobes each bearing 10 minute setae with large sockets on the posterior surface and about 10 long setae on the anterior surface, posterior large median unpaired lobe with 5 + 5 sensory-type setae near the distal margin on the anterior surface, posterior surface with large setae, papillae at either side of genital orifice slightly raised and bearing 7 to 10 short sensory setae each, genital opening not ringed with setae, spermatophore burster a slender tube, ten times as long as wide, slightly swollen posteriorly, sternite IX 2 + 2M, sternite X 8 + 8M, ventral carinae distinct, acropygidium distinct, rounded. Abdominal pleurae: prepleurite 1M, pleurite 1M and 2m. Styli typical.

*Forceps*: Right arm uniserial with two prominent teeth near median, predental margin with 6 sharp toothlets (4 in young specimens), interdental 6 toothlets grading posteriorly into denticles, postdental margin with 8 visible crenulations; left arm with two prominent teeth, one basal and one distal, predental margin uniserial with 7 sharp toothlets (5 in young adults), interdental margin with  $\frac{4}{8}$  denticles, postdental margin crenulate.

*Male*: Similar to female, except stage I male with one row of glandular setae in the lateral subcoxal organs, average 6 + 7 setae, stage II with two rows of glandular setae, average 25 + 25 setae, stage III males with three rows of glandular setae, average 45 + 45 setae, and stage IV males with 4 rows of glandular setae, average 75 + 75 setae. Male genital papillae conical as wide at the base as long, mesad surface of papilla with 11 setae each as long as the papilla, shorter setae on the laterad side, genital orifice ringed with 20 setae anteriorly and 20 larger setae posteriorly, posterior flap with 50 large uniform setae.

Length of body including forceps: average, five largest females 12.0, five largest males 10.0 mm.

*Types*: Holotype ♀ and paratypes in California Academy of Sciences, paratypes in USNM, California Insect Survey, Berkeley, and University of California, Davis.

*Habitat*: Type female, 8 paratype females, 10 paratype males, and 10 juveniles collected in humus and soil, Olmué, near Limache, Chile, 21 April 1961 by L. M. Smith and N. Hichins; 2 males, 2 females and one juvenile, Jardín Botánico Nacional, Viña del Mar, Chile, 4 July 1961 by L. M. Smith and N. Hichins; 5 males, 3 females, and one juvenile, 3 to 16 inches deep in soil, Quebrada El Soldado, El Cobre, Chile, 15 March 1961, L. M. Smith and N. Hichins; 6 females, 1 male and 1 juvenile, Hacienda La Palma, Quillota, Chile, 12 August 1961 by N. Hichins; 4 females and 2 males, Cerro El Quisco, Quillota, Chile, 1 August 1961, 19 males, 18 females and 5 juveniles, El Soldado, El Cobre, Valparaiso

Province, Chile, 18 October 1961, by L. Caltagirone and N. Hichins.

Dedicated to Dr. L. E. Caltagirone.

Silvestri (1948-49) named the new genus *Hapljapyx* and as a description stated how it differed from *Austrjapyx*. The type is *Hapljapyx lopesi* Silv. from Brazil. In this same publication Silvestri described 14 species in this genus collected in Brazil, Argentina, Paraguay, Chile, and Nairobi, Africa. A study of these species shows that the glandular setae of the lateral subcoxal organ may be of unequal length, same length, in one row, or several rows; the median subcoxal organ may be devoid of structures, or with pseudopores, or setae, or special loop-shaped structures, male sacs may be absent, or present on segment III, or III and IV, with or without internal setae, postero-lateral angles or tergite VII may be projected to the rear, or not projected, simply rounded, antennae with 24 to 34 segments. It thus appears that this genus is a catchall, and not susceptible of definition. Silvestri's two Chilean species may be identical and show characters different from other species now in the genus *Hapljapyx*. I therefore place them in the new genus *Rossjapyx* and define it as follows.

#### **Rossjapyx**, new genus

Distal lamina of lacinia pectinate, lacinia with a subapical flange, antenna with 27 segments (in type species), no setal proliferation on midsegments of the antenna, lateral subcoxal organs each occupying about one-third of the distance between the styli, glandular setae subequal in length, arranged in 1 to 3 rows, sensory setae almost as long as the glandular setae, and widely spaced, few in number, median subcoxal area protruding posteriorly, without disculi or pseudopores, but with 2 + 2 microsetae, empodium as long as pretarsus and parallel to tarsal claws, all styli with large secondary cone, one large external seta and one basal pore, abdominal tergite I prescutum with 1 + 1M, scutum 2 + 2M, tergites VI and VII with postero-lateral angles projected to the rear (rarely VI not so), tergite X between the carinae 3 - 4 + 3 - 4M or 2 + 1 + 2M but carinae often faint or absent, forceps setae A small (Fig. 2), basal buttress small, dorsal articulation of forceps elongate pointed to the rear, forceps nearly symmetrical with denticles located only in the basal third of each arm, right arm usually uniseriate with two or three small denticles, but rarely  $\frac{1}{2}$ , the rest of margin slightly crenulate, left arm with 1/1/1/1 followed by 3 to 5 small hemispherical denticles widely separated, or these latter may be absent, inner face of right arm with 15 ± vertical ridges sclerotized. Male with setose sacs in III and IV with 6 - 12 + 6 - 12 branched setae.

Type: *Rossjapyx australis* L. Smith.

#### **Rossjapyx australis**, new species

*Female*: Head with about 15 + 15M dorsally, labrum emarginate, lacinia falciform without a tooth, distal lamina of lacinia pectinate, and nearly as long as the next lamina, all laminae curved, galea with one

external seta, thumb of galea with many small projections and terminally three larger curved projections, terminal segment of maxillary palpus with 17 setae, 6 of which are very long, mandible with 4 strong teeth and a dorsal knob representing the fifth tooth, antenna with 27 segments, slightly tapering apically, segment 3 with a whorl of 12 large setae and a basal whorl of 12 smaller setae, terminal segment of antenna narrower than penultimate, placoid sensillae three, trichobothria one-half to two-thirds as long as adjacent longest antennal setae, labial palpus tapered 2.6 times as long as wide at the base, with 8 setae the two terminal of which are slightly shorter than the palpus.

*Thorax:* Normal, scuta each with 10M, legs normal, coxa with 4 setae, trochanter with 10 setae, femur with a dorsal apical row of 3 long, 1 short, and 1 long, tibia with one calcar seta clearly thicker than other tibial setae, tarsi with 4 or 5 large ventral setae per row, tarsal claws unequal, empodium longer than the pretarsus and pointed slightly upward.

*Abdomen:* Tergite I 3 + 3M, tergites II-VII with 7 + 7M, postero-lateral angles of tergites II-V rounded, of tergites VI and VII slightly projected to the rear as blunt processes, sides convex, tergite VIII dorsally 3 + 3M, postero-lateral angles slightly projected to the rear, tergite IX 3 + 3m on posterior margin, tergite X between the carinae 4 + 4M and 4 + 4m and a few microsetae, carinae indistinct. Sternum I apotome 3 + 3M alternating with 3 + 3m, sternite 16 + 16M, and 12 + 12 shorter antecedent setae arranged in two irregular rows just anterior to the lateral subcoxal organs, each lateral subcoxal organ occupying one-third of the distance between the styli, composed of 2 to 3 rows of glandular setae subequal in length and one-half as long as the antecedent setae, a sparse row of sensory setae, widely spaced, varying from 2 to 12 on each side, as long as the glandular setae, glandular setae 50 - 100 + 50 - 100, median subcoxal area with posterior extension, rugose, with 2 + 2 microsetae, no other structures. Sterna II-VII apotomes with no setae, sternites 16 + 16M and many microsetae, sternite VIII 8 + 8M and 6 + 6m, genital area normal with 8 - 12 + 8 - 12 short sensory setae at either side of the genital orifice on slightly raised areas, spermatophore burster a slender tube ten times as long as wide, not swollen posteriorly, ventral portion of IX with 3 + 3M, sternite X with 10 + 10M, ventral carinae indistinct, acropygidium distinct, rounded rugose, abdominal pleurae: prepleurite 1M, pleurite 1M, 2m, and 7 microsetae. Styli typical.

*Forceps:* Typical for the genus.

*Male:* Similar to female. Male genital papillae conical, twice as long as wide at the base, mesad surface with 9 long setae, laterad 5 minute sensory setae and 2 long setae, posterior flap with 8 large setae in one transverse row, each seta longer than the genital papilla. Male setose sac in III with 16-18 branched setae, and in IV with 8-13 branched setae.



Length of body including forceps: average, 2 males 14.0, 3 females 15.0 mm.

*Types*: Holotype ♀ in USNM, paratypes in California Academy of Sciences and University of California, Davis.

*Habitat*: Type female, Mocopulli, Chiloe, Chile, 22 February 1945 by E. A. Chapin; 1 ♂ and 1 ♀ Los Muermos, Llanquihue, Chile, 20 January 1951, Ross and Michelbacher; 1 ♀ 8 miles west of Puerto Varas, Llanquihue, Chile, 24 January 1951, both by Ross and Michelbacher.

Genus dedicated to Dr. Edward S. Ross.

*Rossjapyx anodus* (Silv.)

*Haplajapyx anodus* Silv. 1948-49.

*Haplajapyx subanodus* Silv. 1948-49.

*Female*: Similar to *R. australis* except: segment 3 of antenna with basal whorl of 6 small setae, coxa with 8 setae, trochanter with 14, abdominal tergite I 2 + 2M, tergite VIII 4 + 4M, tergite X 3 + 1 + 3, carinae distinct, sternite VIII 7 + 7M, segment X with ventral carinae distinct, abdominal pleurae: prepleurite 1M, pleurite 2M + 1m and 10 microsetae.

*Male*: Similar to *R. australis* with 12-24 branched setae in sacs on III and IV.

Silvestri (1949) described *H. anodus* from Temuco and *H. subanodus* from Coipué near Villa Rica, Chile. These two occur 75 miles apart in similar terrain. They were distinguished by a single row of glandular setae in *anodus* as compared to 2 rows in *subanodus*. I have examined a topotype ♀ of *anodus* from Temuco and this specimen shows two rows of glandular setae. It is well known that the number of rows of glandular setae may increase in some species with successive adult molts and they are therefore regarded as synonymous.

**Penjapyx**, new genus

Distal lamina of lacinia pectinate, lacinia with small subapical tooth, antenna with 32 segments, strongly tapered apically, 4 or more mid-segments of the antenna showing setal proliferation, mandible with 4 teeth and a small obtuse projection representing the fifth tooth, labrum emarginate, lateral subcoxal organs each occupying about one-fourth of the distance between the styli, glandular setae all same length, four-tenths as long as stylus I, arranged in one row, sensory setae half as long as glandular setae, separated by width of setal socket, median subcoxal area slightly projected to the rear with 2 + 2 microsetae, no pores or disculi, tarsal claws unequal, empodium absent or very small, styli I-IV with large, pointed secondary cone, external seta subequal in length to stylus, one basal pore, abdominal tergite I prescutum with 1 + 1M and 2 + 2 microsetae, scutum 1 + 1M and some microsetae, tergites I-VII with 5 + 5M and with postero-lateral angles rounded, tergite X between the carinae 2 + 2M, carinae distinct, parallel, acropygidium prominent, rounded, forceps seta A one-fourth as long as adjacent long seta, dorsal articulation rounded, basal buttress present, right arm of forceps uni-

seriate, premedian, pointed tooth, predental tubercles 3, postdental crenulations 15-20, left arm basal portion slightly arcuate with  $\frac{5}{6}$  denticles, rest of margin smooth. Male without setose sacs in III or IV.

Type: *Penjapyx altus* L. Smith.

***Penjapyx altus*, new species**

*Male*: Head with 9 + 9M and a few microsetae, distal lamina of lacinia with 10 teeth, all laminae curved, galea with one external seta, thumb of galea with one lateral seta, thumb sclerotized, and three terminal projections forming hooks directed toward the mouth, terminal segment of maxillary palpus with 15 setae of various sizes, the largest of which, median, 1.2 times length of palpal segment, mandible with 4 teeth, antenna with 32 segments, tapered, segment 3 of antenna with distal whorl of 10 setae, 6 of which long, and basal whorl of 12 setae, 3 of which long, segments 8 to 15 with postero-ventral proliferation of setae between distal and basal whorl, terminal segment not hemispherical but somewhat elongate, placoid sensillae 6, trichobothria half as long as longest seta on same segment, labial palpus slightly tapered, 2.5 times as long as wide at the base, with 8 setae of which two terminal, longest, slightly longer than the palpus.

*Thorax*: Classical 10, 10, 10 setae on scuta, each as long as corresponding tibia, not confused by large m, mesocoxa with 4 setae and 2 microsetae, trochanter with 4 setae and some microsetae, dorsal apex of femur with a row of 4 subequal setae, tibia with two calcar setae nearly equal, tarsi with 6 stout setae per ventral row, tarsal claws unequal, empodium a small swelling on the pretarsus.

*Abdomen*: Tergite I prescutum 1 + 1M, scutum 1 + 1M, and a few microsetae, terga II-VII 5 + 5M, angles rounded, tergite VIII dorsal 6 + 6M, IX dorsal no setae, X between carinae 2 + 2M, carinae distinct, parallel, pygidium distinct, flattened. Sternum I apotome 3 + 3M and 2 + 2m, sternite 13 + 13M, and some microsetae, antecedent setae: a group of 9 laterad of each stylus, 26 + 29 anterior to lateral subcoxal organs, and 6 + 6 anterior to median subcoxal area, lateral subcoxal organs each occupying one-fourth of the distance between the styli, composed of one row of equal glandular setae 21 + 24 and sensory setae 23 + 25 separated by the width of one setal socket, median subcoxal area projecting slightly to rear with 2 + 2 microsetae, no pores or disculi, sterna II-VII apotomes without setae, sternites II-VI 15 + 15M and microsetae, sternite VII 14 + 14M, sternite VIII 7 + 7M, segment IX ventral 3 + 3M, genital area: papillae rounded at apex, 1.5 times as long as wide at the base, mesad surface covered with short setae, laterad surface without setae, genital orifice ringed with small setae, posterior flap with a row of 12 long setae, segment X between ventral carinae 8 + 8M and 1 + 1 postero-median m.

*Forceps*: Seta A one-fourth as long as adjacent seta, dentition typical for the genus.

Female unknown.

Length of body including forceps: 12 mm.

*Type:* Holotype ♂ in California Academy of Sciences.

*Habitat:* La Laguna, Cordillera de Coquimbo, Chile, November 1957, 6,600 feet elevation, by Mr. L. E. Peña.

Silvestri (1949) erected the genus *Merojapyx* with *M. speggazzinii* Silv. as the type. This Argentinian species was characterized by having the postero-lateral angles of the seventh tergite conspicuously projected to the rear. In the same publication Silvestri described *Merojapyx porteri* from a single juvenile female and *Merojapyx riverosi* from a single juvenile male, both from Chile. These two specimens, according to Silvestri, do not have the postero-lateral angles of the seventh tergite projected to the rear, and for other reasons cannot be assigned to the genus *Merojapyx*. In the same publication, Silvestri redescribed *Merojapyx bidentatus* Schaffer (under the name *bidentaus!*) from a specimen collected in Chile, but he stated that it disagreed in important characters with Schaffer's description. From these facts, I conclude that the genus *Merojapyx*, native of Argentina, has not yet been demonstrated to occur in Chile.

KEY TO GENERA OF CHILEAN JAPYGINAE

1. Both arms of forceps uniseriably dentate, dorsal carinae of segment X absent, abdominal tergites with 12 large m, antenna with 26 segments ..... *Nelsjapyx*  
 Left arm of forceps biserially dentate, dorsal carinae of segment X present, abdominal tergites with less than 6m, antenna with more than 26 segments ..... 2
2. Forceps without large teeth, basal denticles and toothlets only, biserial on right arm and in four ranks on left arm, segment X with 5 + 5 setae between dorsal carinae, antenna with 27 segments ..... *Rossjapyx*  
 Each arm of forceps with at least one large tooth, segment X with 2 + 2M or 3 + 3M between dorsal carinae, antenna with 30 or more segments ..... 3
3. Teeth of both arms of forceps premedian or one median, segment X 1.2 times as long as wide ..... 4  
 Left arm of forceps with a distinctly postmedian tooth, segment X as wide as long ..... 5
4. Left arm of forceps with tooth median, tergites VI and VII with postero-lateral angles projected to the rear, and with 3 + 3 antero-lateral M, antenna with 30 segments ..... *Teljapyx*  
 Left arm of forceps with tooth premedian, tergites VI and VII with postero-lateral angles not projected to the rear, and with 2 + 2 antero-lateral M, antenna with 32 segments ..... *Penjapyx*
5. Both arms of forceps biserially dentate, each arm with one large tooth, dorsal articulation pointed, seta A of forceps about one-third as long as adjacent large seta, antenna with 35 to 44 segments ..... *Valpjapyx*

Right arm of forceps uniserially dentate, each arm with two large teeth, dorsal articulation rounded, seta A of the forceps reduced practically to microseta, antenna with 30 segments ..... *Chiljapyx*

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